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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/735,900	12/16/2003	Kenta Ogawa	8001-1183	5711

466 7590 07/26/2006

YOUNG & THOMPSON
745 SOUTH 23RD STREET
2ND FLOOR
ARLINGTON, VA 22202

EXAMINER

ZIMMERMAN, JOHN J

ART UNIT	PAPER NUMBER
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1775

DATE MAILED: 07/26/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/735,900

Applicant(s)

OGAWA, KENTA

Examiner

John J. Zimmerman

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 April 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2 and 5-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2 and 5-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

SECOND OFFICE ACTION

Amendments

1. This Second Office Action is in response to the paper titled "AMENDMENT" received April 28, 2006. Elected claims 1-2 and 5-10 are pending in this application. Non-elected species claims 3-4 have been cancelled.

Claim Rejections - 35 USC § 102/103

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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4. Claims 1-2, 5-6 and 8-9 are rejected under 35 U.S.C. 102(b) as anticipated by Nishikawa (JP 2001-053211).

5. Nishikawa discloses that the prior art semiconductor devices had lead material having a Sn-Bi plating layer on the lead material containing 3-5% Bi and having a thickness of "about" 10 microns (e.g. see paragraph [0003]; Figure 3). The term "about" clearly encompasses plating layer thicknesses of just greater than 10 microns. Nishikawa's specifically disclosed prior art endpoint of 5% Bi and prior art plating thickness of "about" 10 microns fall directly in conditional expression "(c)" of independent claim 1 and conditional expression "(a)" of independent claim 2. In view of the fact that Nishikawa specifically discloses the 5% Bi endpoint of bismuth content in the tin alloy, the applicant's claims are disclosed with sufficient specificity to be anticipated. See MPEP 2131.03. Regarding the claim limitation requiring a "plurality of external terminals each having a base terminal" (e.g. claim 1, lines 2-3; claim 2, lines 2-3) and the limitation that the base material is a "conductive material" (e.g. see claims 6 and 9), even though Nishikawa may not discuss the conductivity or illustrate the entire leadframe in the figures, one of ordinary skill in the art understands that semiconductor device leadframes in the prior art are conductive and have a plurality of external terminals to connect the semiconductor chip to the circuit board. The level of ordinary skill in the art *must* be taken into account when considering the prior art and one of ordinary skill in this art is familiar with a leadframe configuration and therefore it is not necessary that Nishikawa describe or illustrate such conventional prior art configurations in detail.

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6. Claims 1-2 and 5-10 are rejected under 35 U.S.C. 103(a) as obvious over Nishikawa (JP 2001-053211) in view of Sugihara (U.S. Patent 6,392,293).

7. Nishikawa discloses that the prior art semiconductor devices had lead material having a Sn-Bi plating layer on the lead material containing 3-5% Bi and having a thickness of "about" 10 microns (e.g. see paragraph [0003]; Figure 3). The term "about" clearly encompasses plating layer thicknesses of just greater than 10 microns. Nishikawa's specifically disclosed prior art endpoint of 5% Bi and prior art plating thickness of "about" 10 microns meet conditional expression "(c)" of independent claim 1 and conditional expression "(a)" of independent claim 2. Nishikawa specifically discloses 3-5% Bi content in the tin alloy and therefore the subject matter as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made to have selected the overlapping portion of the range disclosed by the reference because overlapping ranges have been held to be a *prima facie* case of obviousness, see *In re Malagari*, 182 USPQ 549. Regarding the claim limitation requiring a "plurality of external terminals each having a base terminal" (e.g. claim 1, lines 2-3; claim 2, lines 2-3) and the claim limitation that the base material is a "conductive material" (e.g. see claims 6 and 9), even though Nishikawa may not discuss the conductivity or illustrate the entire leadframe in the figures, one of ordinary skill in the art understands that semiconductor device leadframes in the prior art are conductive and have a plurality of external terminals which connect the semiconductor chip to the circuit board. The level of ordinary skill in the art *must* be taken into account when considering the prior art and one of ordinary skill in this art is familiar with standard leadframe configurations and therefore it is not necessary that Nishikawa describe or illustrate such

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conventional prior art configurations in detail. In any event, Sugihara is applied to clearly show that a conventional lead frame configuration comprises a plurality of leads for connecting a semiconductor device to a circuit board and that the standard leadframes are conventionally made from copper alloys or iron-nickel alloys (e.g. see column 5, line 54 - column 6, line 5). In view of Sugihara, it would have been obvious to one of ordinary skill in the art at the time the invention was made to manufacture the leadframe of Nishikawa with a plurality of lead terminals and to use a copper alloy or iron-nickel alloy because Sugihara shows that standard leadframes in the art are indeed constructed in this manner.

8. Claims 1-2 and 5-10 are rejected under 35 U.S.C. 103(a) as obvious over Okudaira (JP 2002-141456).

9. Okudaira discloses semiconductor device lead materials having a Sn-Bi lower plating layer (7) containing 0.5 to 6 wt.% Bi and having a thickness of 10 micrometers (e.g. see paragraphs [0012], [0028]). Okudaira's plating thickness of 10 microns so closely approximates applicant's requirement of just greater than 10 microns (i.e. " $10 < X_m < 15$ ") in conditional expression "(c)" of independent claim 1 and conditional expression "(a)" of independent claim 2 that one of ordinary skill in the art would expect the results to be the same or indistinguishable. Okudaira's specifically disclosed prior art endpoint of 6% Bi falls directly in the conditional expression "(c)" of independent claim 1 and conditional expression "(a)" of independent claim 2. The subject matter as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made to have selected the overlapping portion of the range disclosed

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by the reference because overlapping ranges have been held to be a *prima facie* case of obviousness, see *In re Malagari*, 182 USPQ 549. Regarding the claim limitation requiring a "plurality of external terminals each having a base terminal" (e.g. claim 1, lines 2-3; claim 2, lines 2-3) and the limitation that the base material is a "conductive material" (e.g. see claims 6 and 9), Okudaira discloses a multiple lead device (e.g. see Figure 1) and discloses that the leadframes can be made of copper alloy or iron-nickel alloy (e.g. see paragraph [0016]).

10. Claims 1-2 and 5-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shimokawa (U.S. Patent Application Publication 2002/0019077).

11. Shimokawa discloses semiconductor device lead materials having a Sn-Bi plating layer (e.g. see Figure 1) containing 5 wt.% Bi which is plated directly on the base member (e.g. see examples in Figures 4-8). As shown in the specification's Examples 1 and 2 (e.g. see paragraphs [0052]-[0053]), iron-nickel alloy is considered a standard lead material by Shimokawa.

Shimokawa may differ from the claims in that Shimokawa may not disclose a specific Sn-Bi layer plating thickness for the Sn-5 wt.% Bi alloy (which has been plated directly on the base member) as shown in Figures 4-8. Shimokawa, however, does disclose examples of plating Sn-Bi plating layers containing 5 wt.% Bi in thicknesses of "about" 10 micrometers on an intermediate copper layer (e.g. see paragraphs [0053]) and also does show plating other Sn-Bi alloy layers directly on the base member in a thickness of about 10 micrometers (e.g. see paragraph [0052]). The term "about" clearly encompasses plating layer thicknesses of just greater than 10 microns. Therefore, it would have been obvious to one of ordinary skill in the art

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at the time the invention was made to plate the directly plated Sn-Bi alloy layers (having 5 wt.% Bi) of Shimokawa in a thickness of "about" 10 microns since Shimokawa shows this to be standard thickness for his plated Sn-Bi layers in his examples. Shimokawa's example of Sn-5% Bi at a plating thickness of "about" 10 micrometers would meet the conditional expression "(c)" of independent claim 1 and conditional expression "(a)" of independent claim 2.

Response to Arguments

12. Applicant's arguments filed April 28, 2006 have been fully considered but they are not persuasive.

13. Applicant argues that the Nishikawa (JP 2001-053211) and Okudaira (JP 2002-141456) are non-English language references and that since no translation was provided by the examiner, the rejections based on these references are improper and should be withdrawn. The examiner notes that it is applicant that cited the Nishikawa and Okudaira references and it is applicant that provided their accompanying English language translations. It is not clear how applicant determined that machine generated English translations are not "translations". MPEP 706.02(II) does not require that the examiner supply applicant with a further English translation of a foreign document which already has an English language translation. Indeed, MPEP 706.02(II) only states that "a translation (if not in English) may be supplied". There appears to be no basis for applicant's assertion that the examiner's reliance on the applicant-supplied machine generated English language translation is improper and merits withdrawal of the rejections. In any event, an oral translation by the translation branch of the U.S. Patent and Trademark Office confirms

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that paragraph [0003] of Nishikawa (JP 2001-053211) discloses that the thickness of the Sn-Bi plating layer 12 on the lead material 11 is "about" 10 microns.

14. Regarding the rejection the claims under 35 U.S.C. 102(b) as anticipated by Nishikawa (JP 2001-053211), applicant argues that "MPEP 2131.04 II" states that a specific example must fall within the claimed range to have anticipation. Applicant is in error since MPEP 2131.03 II clearly states that when "the prior art discloses a range which touches, overlaps or is within the claimed range, but no specific examples falling within the claimed range are disclosed, a case by case determination must be made as to anticipation. In order to anticipate the claims, the claimed subject matter must be disclosed in the reference with sufficient specificity to constitute an anticipation under the statute." Therefore, on a case by case basis, a determination can indeed be made if the claimed range is anticipated even if no specific examples fall within the claimed range. In view of the fact that Nishikawa specifically discloses the 5% Bi endpoint of bismuth content in the tin alloy and a layer thickness of "about" 10 microns, the applicant's claims are disclosed with sufficient specificity to be anticipated. An entire third of the Bi content range of applicant's expression (c) in claim 1 is covered by Nishikawa with the endpoint of Nishikawa's Bi range falling directly in the applicant's claimed range. Nishikawa's use of the term "about" to describe the Sn-Bi plating thickness clearly includes plating layer thicknesses of just greater than 10 microns, just as applicant's expression $10 < X_m < 15$ clearly includes plating thicknesses of just greater than 10 microns. Therefore the claimed subject matter is disclosed by Nishikawa with "sufficient specificity" to "anticipate" the rejected claims.

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15. Regarding the rejections based on obviousness, applicant argues that "a *prima facie* case of obviousness is rebutted by the unexpected results of the claimed combinations of thickness and Bi concentration". A review of applicant's original disclosure, however, shows insufficient factual evidence to establish any unexpected results commensurate with applicant's claimed thickness and composition ranges. It is not clear where actual data points in Figure 6 meet each of the expressions in the claims (e.g. expression (c) of claim 1). It is also not clear where the endpoints of the claimed expressions (e.g. expression (c) of claim 1) are established in either Figure 6 or Figure 7. With the minimal data disclosed by applicant, it is not clear whether unexpected results occur which are commensurate with the scopes of the claimed expressions. As noted in MPEP 716.02(d), unexpected results must be commensurate with the scope of the claimed invention. Whether the unexpected results are the result of unexpectedly improved results or a property not taught by the prior art, the "objective evidence of nonobviousness must be commensurate in scope with the claims which the evidence is offered to support."

Unexpected results are reviewed to see if the results occur over the entire claimed range. *In re Clemens*, 622 F.2d 1029, 1036, 206 USPQ 289, 296 (CCPA 1980). See also *In re Peterson*, 315 F.3d 1325, 1329-31, 65 USPQ2d 1379, 1382-85 (Fed. Cir. 2003) (data showing improved alloy strength with the addition of 2% rhenium did not evidence unexpected results for the entire claimed range of about 1-3% rhenium).

Conclusion

16. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a). A shortened statutory period for reply to this final action

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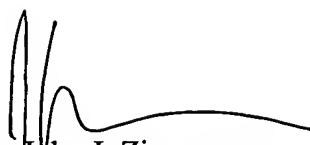
is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to John J. Zimmerman whose telephone number is (571) 272-1547. The examiner can normally be reached on 8:30am-5:00pm, M-F. Supervisor Jennifer McNeil can be reached on (571) 272-1540. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

18. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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John J. Zimmerman
Primary Examiner
Art Unit 1775

jjz
July 14, 2006